

Project Fact Sheet

CEC / SMUD Regen Project 3.3 Mainstreaming PV for Residential Roofs

GOALS

- Develop a market-ready product that improves upon existing residential PV roofing products in terms of cost, ease and speed of installation, and electrical and thermal performance.



PROJECT DESCRIPTION

PowerLight will develop a new residential PV roofing product, designed for both retrofit and BIPV applications, which meets the CEC goal of affordability. The product is a system of roof tiles with and without PV, with thermal insulating properties which significantly decrease house-cooling loads through a novel, strictly passive, means of roof deck temperature reduction and lowered attic dew points. The product will have a 50-year design life and will increase roof durability. Under this subcontract, PowerLight will carry out advanced design development, improving on first-generation prototypes, building and testing advanced prototypes, and using focus groups for product evaluation. A full-scale demonstration system will be installed and monitored for thermal and electrical performance. Requirements for certifications and code compliance will be fulfilled. A plan for high volume manufacturing will be completed.

The new roofing product will:

- Add insulation value of R-50 to the rooftop (both PV and non-PV tiles, which go around the PV array and on the roof's north slope.
- Maintain PV cell temperatures at relatively cool, "rack-mount" levels, unlike other direct-mounted, building-integrated PV products, resulting in 10-18% higher module output.
- Be certified by Underwriters Laboratories (UL), International Conference of Building Officials (ICBO), and Institute of Electrical and Electronics Engineers (IEEE).
- Be designed for retrofit and building-integrated applications, both waterproof assemblies.



- Be simple to install using traditional roofing practices, including waterproofing, and edge, ridge, and eave details. PV modules snap into a pre-engineered mounting system, easily done by one person on a sloped roof surface.
- Integrate electrical wiring and interconnection into the mounting system, which will be accessible after installation.
- Have electricity and thermal performance that could obtain recognition by CEC Title 24.
- Have a 50-year design life and increases roof durability.

BENEFITS TO CALIFORNIA

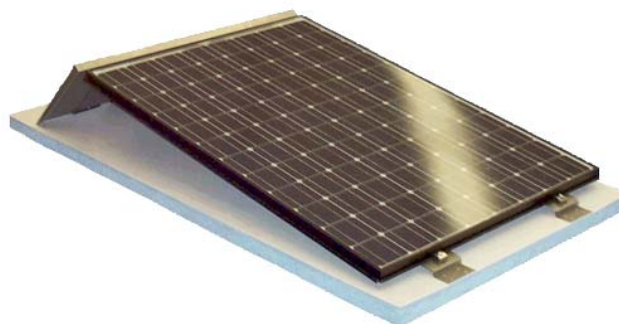
The result of this project will be a market-ready product meeting the objectives listed above, which improves upon existing residential PV roofing products in terms of cost, ease and speed of installation, and electrical and thermal performance. The product's electrical and thermal performance will be capable of recognition by CEC Title 24.

The product will offer all the advantages of distributed electricity generation, especially reduced loads and system outages for utilities and dramatically reduced peak period electricity charges for homeowners. Most effective in high sun times, the product will support the electrical grid in countering daytime summer air conditioning loads, critical in California's hot inland areas. Generating electricity in peak demand periods, the product will offset expensive residential electricity consumption. Non-PV tiles will cool any non-PV roof faces (e.g. northern), and create an attractive, integrated appearance around the PV array.

High-volume manufacturing will allow this product to be purchased in MWs by utilities at low cost, to offer to their residential customers. The target cost of materials is \$1.50/sf over the cost of PV; insulation value will add \$0.15-\$0.30/sf to product value. This target cost is below that of comparable products currently available.

FUNDING AMOUNT

Commission	\$1,500,000
Match Total	\$2,038,232
Total	\$3,538,232



PROJECT STATUS

Project is underway.

FOR MORE INFORMATION

Joseph McCabe
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, CA 95814-5504
(916) 654-4412
jmccabe@energy.state.ca.us

Thomas Dinwoodie
PI, President/CEO
PowerLight
2954 San Pablo Ave.
Berkeley, CA 94710

